

What Works Clearinghouse



Beginning Reading

August 13, 2007

Ladders to Literacy for Kindergarten Students

Program description¹

Ladders to Literacy is a supplemental early literacy curriculum published in *Ladders to Literacy: A Kindergarten Activity Book*. The program targets children at different levels and from diverse cultural backgrounds—those who are typically developing, have disabilities, or are at risk of reading failure. The activities are organized into

three sections with about 20 activities each: print awareness, phonological awareness skills, and oral language skills. While a *Ladders to Literacy* curriculum is also available for preschool students (*Ladders to Literacy: A Preschool Activity Book*), this intervention report focuses on the Kindergarten version of the curriculum.

Research

Four studies of *Ladders to Literacy* met the What Works Clearinghouse (WWC) evidence standards with reservations. The studies included 760 students from Kindergarten classrooms at more than 14 elementary schools in urban and rural Midwest districts.² The

WWC considers the extent of evidence for *Ladders to Literacy* to be moderate to large for alphabetics and comprehension and small for fluency. No studies that met WWC evidence standards with or without reservations addressed general reading achievement.

Effectiveness

The *Ladders to Literacy* program was found to have potentially positive effects on alphabetics and fluency and mixed effects on comprehension.

	Alphabetics	Fluency	Comprehension	General reading achievement
Rating of effectiveness	Potentially positive effects	Potentially positive effects	Mixed effects	na
Improvement index ³	Average: +25 percentile points Range: +8 to +47 percentile points	+26 percentile points	Average: +9 percentile points Range: +1 to +17 percentile points	na

na = not applicable

1. The descriptive information for this program was obtained from publicly available sources: the program's and distributor's web sites (www.wri-edu.org/ladders; www.brookespublishing.com; downloaded April 2007) and the research literature (O'Connor, 1999; Fuchs, Fuchs, Thompson, Al Otaiba, Yen, Yang et al., 2001). The WWC requests developers to review the program description sections for accuracy from their perspective. Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review.
2. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.
3. These numbers show the average and range of improvement indices for three of the four studies. One additional study that showed positive effects in alphabetics was not included in this average and range because effect sizes were not calculated at the student level.

Additional program information

Developer and contact

Ladders to Literacy was developed as a preschool to Kindergarten curriculum by Drs. Notari-Syverson and O'Connor in 1993. The kindergarten *Ladders to Literacy* book by Drs. O'Connor and Notari-Syverson was first published in 1998 and a second edition was published in 2005. The *Ladders to Literacy* books are distributed by Brookes Publishing Company. Address: Brookes Publishing Co., P.O. Box 10624, Baltimore, MD 21285-0624. Email: custserv@brookespublishing.com. Web: www.brookespublishing.com. Telephone: (800) 638-3775. For professional development training, see <http://www.brookespublishing.com/onlocation>.

Scope of use

According to the developers, the *Ladders to Literacy* activities and professional development have been field-tested in a variety of kindergarten settings. These include sites that serve young children with disabilities in inclusive and special education settings, as well as sites with small and large groups of children reflecting a range of interests and abilities.

Teaching

This supplemental curriculum is published in the book *Ladders to Literacy: A Kindergarten Activity Book*, which focuses on developing early language and literacy skills. *Ladders to Literacy: A Kindergarten Activity Book* addresses three components: print awareness, phonological awareness, and oral language skills. Typically the teacher chooses activities that can be included in the current classroom routines and that require little preparation time. There are approximately 20 activities in each of the three sections. Some activities can be included weekly, monthly, or on a one-time basis. Most of the activities are designed for large groups and follow a similar format.

Print knowledge activities are designed to help children construct meaning by answering the teacher's questions about environmental print, conventions of print, letter names, and letter sounds. In addition to books, teachers use newspapers, menus, recipes, signs, messages, and writing experiences as learning tools. For the phonological awareness activities, children identify environmental sounds, repeat words or phrases in songs and nursery rhymes, manipulate phonemes in games of alliteration, and blend and segment words. The oral language section contains a collection of activities that provide conversational topics intended to facilitate language development. Using storybooks, pictures, objects, and films, teachers lead the children in labeling and describing objects or events by using questions intended to expand on the child's utterances. Activities in one section (oral language) reference activities in other sections to encourage teachers to integrate activities across skills.

The teachers use the program's observational checklist to determine what tasks and teaching strategies in the lesson are developmentally appropriate for each child. With this information, teachers scaffold instruction by applying more open-ended questioning and feedback to children who need less support and more explicit instruction to children in need of more support.

Cost

The *Ladders to Literacy: A Kindergarten Activity Book* costs \$49.95. The manual contains all the components of the program, including its theoretical framework, lesson plans, assessment checklists, and home activities for parents and children. Professional development for *Ladders to Literacy* is available for an extra cost and consists of a one- or two-day on-site seminar on how to use the curriculum.

Research Six studies reviewed by the WWC investigated the effects of *Ladders to Literacy*. Three studies (O'Connor, 1999, Study A: Intensive Professional Development; O'Connor, 1999, Study B: Traditional Professional Development; and O'Connor et al., 1996) were quasi-experimental designs that met WWC evidence standards with reservations. One study (Fuchs et al., 2001) was a randomized controlled trial with randomization problems that met the WWC standards with reservations.⁴ The remaining two studies did not meet WWC evidence screens.

Met evidence standards with reservations

O'Connor (1999, Study A: Intensive Professional Development) examined outcomes of Kindergarten students in a large urban school district. Students in the intervention and comparison groups received the same district-sponsored pre-reading curriculum. Students in the intervention group also did *Ladders to Literacy* activities. Students in Kindergarten were identified, pre-tested, matched, and divided into two groups. The WWC review of this study focused on the comparison of 64 typical learners in the intervention group with 41 students in the comparison group.⁵

O'Connor (1999, Study B: Traditional Professional Development) examined outcomes of Kindergarten students in a large Midwestern rural school district. Seventeen teachers were assigned to *Ladders to Literacy* or the comparison condition. Students in the intervention and comparison groups received the same district-sponsored pre-reading curriculum, but students in the intervention group also used *Ladders to Literacy* activities. In the analysis of the full sample,⁶ 192 students from nine classrooms were in the intervention group and 126 students from eight classrooms were in the comparison group. In this larger replication of Study A, teachers received less intensive professional training.

O'Connor et al. (1996) examined effects of *Ladders to Literacy* on Kindergarten students in a large urban school district who were instructed by five teachers.⁷ Two transition teachers were randomly assigned to intervention or comparison conditions. The three regular classroom teachers were not randomly assigned to the treatment or comparison condition. Students were matched by type of classroom (general or repeating kindergarteners). The WWC focused on the portion of the sample that included 42 students from three classrooms in the intervention group and 24 students from two classrooms in the comparison group.

4. The study was designed as a stratified randomized controlled trial. As students were selected for inclusion, names were offered to teachers for their review and adjustment. At that point, randomization was not maintained. The WWC examined pretest scores to ensure that intervention and comparison groups were comparable, so the study met WWC evidence standards with reservations.
5. The intervention and comparison groups were divided by ability level (at-risk learners and typical learners). The at-risk subgroup was also examined in the study but the groups were not equivalent at pretest according to WWC analysis and therefore did not meet standards.
6. The sample included both typical learners and students at risk of developing reading problems.
7. Two of the five participating teachers taught students who were repeating Kindergarten in "transition" classes and three were in general classrooms. Additionally, two self-contained classes of Kindergarteners with mild disabilities also participated in the study. Because appropriate controls did not exist for children in the self-contained classes, these classes were not included in the review.

Research (continued)

Fuchs et al. (2001) examined effects of *Ladders to Literacy* on Kindergarten students in an urban school district located in the Midwest. All students received their regular reading curriculum and the intervention group also received the *Ladders to Literacy* curriculum. Teachers were stratified by demographic and background features, and then randomly assigned to conditions. After teacher-level assignment, students of different ability levels were selected to be part of the study. The WWC focused on the portion of the study that included 11 teachers with 136 students in the intervention group and 11 teachers with 135 students in the comparison group.⁸

Extent of evidence

The WWC categorizes the extent of evidence in each domain as small or moderate to large (see the [What Works Clearinghouse Extent of Evidence Categorization Scheme](#)). The extent of evidence takes into account the number of studies and the total sample size across the studies that met WWC evidence standards with or without reservations.⁹

The WWC considers the extent of evidence for *Ladders to Literacy* to be moderate to large for alphabetics and comprehension and small for fluency. No studies that met WWC evidence standards with or without reservations addressed general reading achievement.

Effectiveness Findings

The WWC review of interventions for beginning reading addresses student outcomes in four domains: alphabetics, reading fluency, comprehension, and general reading achievement.¹⁰ The studies included in this report cover three domains: alphabetics, fluency, and comprehension. Within alphabetics, results for four constructs are reported: phonemic awareness, phonological awareness, phonics, and letter knowledge. The findings below present the authors' estimates and WWC-calculated estimates of the size and the statistical significance of the effects of *Ladders to Literacy* on students.¹¹

Alphabetics. Four studies reviewed findings in the alphabetics domain. O'Connor (1999, Study A: Intensive Professional Development) found no statistically significant difference between the *Ladders to Literacy* group and comparison group performance on the phonemic awareness outcome (Test of Short-Term Memory), while the WWC found a statistically significant positive effect.¹² The study author found and the WWC confirmed statistically significant positive effects on two phonological awareness measures (Segmentation and Blending) and one standardized measure of phonics (Woodcock-Johnson (WJ) Letter-Word Identification subtest). The author did not report

8. The study also included an analysis of the effects of *Ladders to Literacy* combined with Peer Assisted Learning (PALS). Although this comparison met evidence standards with reservations, it was not considered in the intervention rating because it went beyond the standard delivery of the program. However, results are reported in Appendices A4.1–A4.3.
9. The Extent of Evidence Categorization was developed to tell readers how much evidence was used to determine the intervention rating, focusing on the number and size of studies. Additional factors associated with a related concept, external validity, such as the students' demographics and the types of settings in which studies took place, are not taken into account for the categorization.
10. For definitions of the domains, see the [Beginning Reading Protocol](#).
11. The level of statistical significance was reported by the study authors or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation, see the [WWC Tutorial on Mismatch](#). See the [WWC Intervention Rating Scheme](#) for the formulas the WWC used to calculate the statistical significance. In the case of *Ladders to Literacy*, corrections for clustering and multiple comparisons were needed for all three O'Connor studies and corrections for multiple comparisons were needed for Fuchs et al. (2001).
12. The author reported results for the total sample and at-risk children, and the WWC focused only on typical learners.

Effectiveness (continued)

statistically significant results for Rhyme production. For the Letter Knowledge measure of Rapid Letter Naming, the author found a statistically significant effect; in WWC calculations, the effect was not statistically significant. The average effect size across the six outcomes was statistically significant.

O'Connor (1999, Study B: Traditional Professional Development) found no statistically significant difference between the *Ladders to Literacy* group and comparison group performance on the phonemic awareness outcome (Test of Short-Term Memory). The author reported statistically significant effects of *Ladders to Literacy* across the phonological skills outcomes (Segmentation, Rhyme Production, and Blending) and measure of phonics (WJ Word Identification). The WWC confirmed statistically significant effects only for the segmentation measure. The average effect size across the six outcomes was statistically significant.

O'Connor et al. (1996) reported statistically significant effects of *Ladders to Literacy* across all measures (Sound Repetition, Blending, First Sound, Segmenting, Rhyme Production, Rapid Letter Naming, and the WJ Word Identification subtest). The WWC confirmed statistically significant effects only for the segmenting measure. The average effect size across the seven outcomes was not statistically significant but was large enough to be considered substantively important (an effect size greater than 0.25) according to WWC criteria.

Fuchs et al. (2001) found positive and statistically significant effects of *Ladders to Literacy* on two phonological awareness measures (Segmentation and Blending); WWC confirmed the

effect for the blending task, while the effect for segmentation was not statistically significant.¹³ The authors found no statistically significant difference between the *Ladders to Literacy* group and comparison group performance on three phonics measures—Rapid Letter Sound and two subtests of the Woodcock Reading Mastery Test: Word Attack and Word Identification. The average effect size across the three outcomes was not statistically significant.

Fluency. O'Connor et al. (1996) found a positive, but not statistically significant effect of *Ladders to Literacy* on the fluency outcome (Test of Oral Reading Fluency).

Comprehension. Three studies examined the effects of *Ladders to Literacy* in the vocabulary construct (O'Connor, 1999, Study A: Intensive Professional Development; O'Connor, 1999, Study B: Traditional Professional Development; and O'Connor et al., 1996). The studies' authors did not find a statistically significant effect of *Ladders to Literacy* on the Peabody Picture Vocabulary Test for any study.

Rating of effectiveness

The WWC rates the effects of an intervention in a given outcome domain as: positive, potentially positive, mixed, no discernible effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings, the size of the difference between participants in the intervention and the comparison conditions, and the consistency in findings across studies (see the [WWC Intervention Rating Scheme](#)).

The WWC found *Ladders to Literacy* to have potentially positive effects on alphabets and fluency and mixed effects on comprehension

Improvement index

The WWC computes an improvement index for each individual finding. In addition, within each outcome domain, the WWC computes an average improvement index for each study and an average improvement index across studies (see [Technical Details of WWC-Conducted Computations](#)). The improvement

index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is based entirely on the size of the effect, regardless of the statistical significance of the effect, the study design, or the

13. The size of the effect was not reported here because student-level data were not available to the WWC. Please see A3.1 for a more detailed explanation.

The WWC found *Ladders to Literacy* to have potentially positive effects on alphabets and fluency and mixed effects on comprehension (continued)

analyses. The improvement index can take on values between –50 and +50, with positive numbers denoting results favorable to the intervention group.

The average improvement index for alphabets is +25 percentile points across three studies, with a range of +8 to +47 percentile points across findings. One additional study that showed positive effects in alphabets was not included in this average and range because the student-level improvement index could not be computed by the WWC.

The improvement index for fluency is +26 percentile points for the single finding in one study.

The average improvement index for comprehension is +9 percentile points across the three studies, with a range of +1 to +17 percentile points across findings.

Summary

The WWC reviewed six studies on *Ladders to Literacy*.¹⁴ Four of these studies met WWC standards with reservations; the others did not meet WWC evidence screens. Based on these studies, the WWC found potentially positive effects on alphabets and fluency and mixed effects on comprehension. The evidence presented in this report may change as new research emerges.

References

Met WWC standards with reservations

O'Connor, R. E. (1999). Teachers learning *Ladders to Literacy*. *Learning Disabilities Research & Practice*, 14(4), 203–214.

(Study A: Intensive Professional Development)

O'Connor, R. E. (1999). Teachers learning *Ladders to Literacy*. *Learning Disabilities Research & Practice*, 14(4), 203–214.

(Study B: Traditional Professional Development)

O'Connor, R., Notari-Syverson, A., & Vadasy, P. F. (1996, April). *The effect of kindergarten phonological intervention on the first grade reading and writing of children with mild disabilities*. Paper presented at the meeting of the American Educational Research Association, New York, NY. (ERIC Document Reproduction Service No. ED394129)

Additional sources:

O'Connor, R., Notari-Syverson, A., & Vadasy, P. F. (1996). *Ladders to literacy: The effects of teacher-led phonological activities for kindergarten children with and without disabilities*. *Exceptional Children*, 63(1), 117–130.

O'Connor, R. E., & Notari-Syverson, A. (1995, April). *Ladders to Literacy: The effects of teacher-led phonological activities for kindergarten children with and without disabilities*.

Paper presented at the meeting of the American Educational Research Association, San Francisco, CA. (ERIC Document Reproduction Service No. ED385378)

Fuchs, G., Fuchs, L. S., Thompson, A., Al Otaiba, S., Yen, L., Yang, N. J., Braun, M., & O'Connor, R. E. (2001). Is reading important in reading-readiness programs? A randomized field trial with teachers as program implementers. *Journal of Educational Psychology* 93(2), 251–267.

Did not meet WWC evidence screens

Notari-Syverson, A., O'Connor, R. E., & Vadasy, P. F. (1996, April). *Facilitating language and literacy development in preschool children: To each according to their needs*. Paper presented at the meeting of the American Educational Research Association, New York, NY. (ERIC Document Reproduction Service No. 395692)¹⁵

Notari-Syverson, A., O'Connor, R. E., & Vadasy, P. F. (1996). *Supporting the development of early literacy in preschool children with disabilities*. Seattle: Washington Research Institute.¹⁵

O'Hearn-Curran, M. C. (1999). What we need to know about linking assessment and phonemic awareness training in

14. A single-case design study was identified but is not included in this review because the WWC does not yet have standards for reviewing single-case design studies.

15. The sample is not appropriate to this review: the parameters for this WWC review specified that students should be in grades K–3 during the time of the intervention; this study did not focus on the targeted grades.

References *(continued)*

the classroom we can learn in kindergarten. *Dissertation Abstracts International*, 60(11), 3904A. (UMI No. 9950194)¹⁶

Disposition Pending

O'Connor, R. E. (2000). Increasing the intensity of intervention in kindergarten and first grade. *Learning Disabilities Research & Practice*, 15(1), 43–54.¹⁷

For more information about specific studies and WWC calculations, please see the [WWC Ladders to Literacy Technical Appendices](#).

16. Confound: this study included *Ladders to Literacy* but combined it with other interventions so the analysis could not separate the effects of the intervention from other factors.

17. The disposition is pending development of WWC evidence standards for single subject designs.